

Effect of Coal Fines and Oxygen Enrichment on Flame Attachment and NO_x

Gregory E. Ogden and Jost O.L. Wendt

Department of Chemical and Environmental Engineering, University of Arizona, Tucson,
AZ

Telephone: 520/621-2591; Fax: 520/621-6048; email: wendt@email.arizona.edu

Abstract

An experimental program was conducted to evaluate the effects of oxygen enrichment and particle size on the ignition stand-off distance in pulverized coal turbulent diffusion flames. A 17 kW furnace, with electrically heated walls, full-length quartz observation window, and an axial burner with interchangeable primary jets and secondary annuli allowed a *systematic* parametric investigation to be conducted. Results show that either oxygen enrichment or addition of coal fines in the primary fuel jet, can *decrease* overall NO_x emissions by attaching an otherwise detached flame. Hence a small amount of O₂ or of coal fines added to a pc burner can inexpensively lower NO_x emissions from a boiler or furnace.